CLAIMS

1-111. (Cancelled)

112. (Currently Amended) Apparatus for providing ventilatory pressure support to a patient comprising

a control mechanism for deriving two separate calculated errors, a fast-error and a slow-error, each of which is a function of the same target ventilation value and a respective one of two different patient ventilation measures each of said patient ventilation measures being taken over different time intervals each with a different speed of response,

wherein the fast-error is calculated based on a patient ventilation measure having a relatively fast speed of response and the slow-error is calculated based on a relatively slow speed of response,

~~the two patient ventilation measures having respective relatively fast and relatively slow speeds of response to said calculated errors,~~

said control mechanism further deriving two control responses of pressure to respective ones of said two calculated fast-error and slow-error errors and combining said two control responses to produce an overall control response, wherein said overall control response ~~that~~ increasingly favors the control response to the slow-error ~~calculated error that is a function of the ventilation measure with the faster speed of response~~ over the control response to the fast-error ~~calculated error that is a function of~~ as the ventilation measure ~~with the~~

~~slower speed of response as the ventilation measure with the faster speed of response~~ becomes increasingly less than said target ventilation value; and

a ventilator responsive to said overall control response for controlling the level of pressure of air delivered to said patient.

113. (Currently Amended) Apparatus for providing ventilatory pressure support to a patient in accordance with claim 112 wherein each of said two control responses is a function of ~~the amplitude and sign of~~ the respective one of said calculated errors so that the control response to the calculated error that is a function of the ventilation measure with the faster speed of response is more vigorous than the control response to the calculated error that is a function of the ventilation measure with the slower speed of response.

114. (Previously Presented) Apparatus for providing ventilatory pressure support to a patient in accordance with claim 113 wherein the degree of control exercised by said ventilator increases with the magnitudes of said two calculated errors.

115. (Previously Presented) Apparatus for providing ventilatory pressure support to a patient in accordance with claim 114 wherein for equal calculated errors below and above said target value, the degree of control exercised by said ventilator is greater for calculated errors below said target value.

116. (Previously Presented) Apparatus for providing ventilatory pressure support to a patient in accordance with claim 115 wherein said target value is an alveolar ventilation that takes into account the patient's anatomical or physiologic dead space.

117. (Currently Amended) Apparatus for providing ventilatory pressure support to a patient in accordance with claim 116 wherein said control mechanism further determines the phase of a ~~the current~~ breathing cycle and adjusts said overall control response to be a function of the amplitude of ~~at~~ the determined phase of said ~~the current~~ breathing cycle of an amplitude-versus-phase template that is appropriate for a normal breathing cycle.

118. (Previously Presented) Apparatus for providing ventilatory pressure support to a patient in accordance with claim 117 wherein said control mechanism determines the phase of the current breathing cycle by relating respiratory airflow and its rate of change to different phases of a normal breathing cycle.

119. (Previously Presented) Apparatus for providing ventilatory pressure support to a patient in accordance with claim 118 wherein said control mechanism determines the phase of the current breathing cycle by applying a set of fuzzy logic rules.

120. (Previously Presented) Apparatus for providing ventilatory pressure support to a patient in accordance with claim 119 wherein said overall control response is a clipped integral of a function of both of said calculated errors.

121. (Previously Presented) Apparatus for providing ventilatory pressure support to a patient in accordance with claim 112 wherein the degree of control exercised by said ventilator increases with the magnitudes of said two calculated errors.

122. (Previously Presented) Apparatus for providing ventilatory pressure support to a patient in accordance with claim 121 wherein for equal calculated errors below and above said target value, the degree of control exercised by said ventilator is greater for calculated errors below said target value.

123. (Previously Presented) Apparatus for providing ventilatory pressure support to a patient in accordance with claim 122 wherein said target value is an alveolar ventilation that takes into account the patient's physiologic dead space.

124. (Previously Presented) Apparatus for providing ventilatory pressure support to a patient in accordance with claim 112 wherein said target value is an alveolar ventilation that takes into account the patient's physiologic dead space.

125. (Previously Presented) Apparatus for providing ventilatory pressure support to a patient in accordance with claim 112 wherein said control mechanism further determines the phase of the current breathing cycle and adjusts said overall control response to be a function of the amplitude at the determined phase of the current breathing cycle of an amplitude-versus-phase template that is appropriate for a normal breathing cycle.

126. (Previously Presented) Apparatus for providing ventilatory pressure support to a patient in accordance with claim 125 wherein said control mechanism determines the phase of the current breathing cycle by relating respiratory airflow and its rate of change to different phases of a normal breathing cycle.

127. (Previously Presented) Apparatus for providing ventilatory pressure support to a patient in accordance with claim 126 wherein said control mechanism determines the phase of the current breathing cycle by applying a set of fuzzy logic rules.

128. (Previously Presented) Apparatus for providing ventilatory pressure support to a patient in accordance with claim 112 wherein each of said calculated errors is a clipped integral of the respective patient ventilation measure minus said target value.

129. (Previously Presented) Apparatus for providing ventilatory pressure support to a patient in accordance with claim 112 wherein said ventilator includes a servo control mechanism whose gain is adjusted in accordance with the magnitudes of said calculated errors.

130. (Previously Presented) Apparatus for providing ventilatory pressure support to a patient in accordance with claim 129 wherein said gain increases with the magnitudes of said calculated errors.

131. (Previously Presented) Apparatus for providing ventilatory pressure support to a patient in accordance with claim 130 wherein for equal calculated errors below and above said target value, said gain is greater for calculated errors below said target value.

132. (Previously Presented) Apparatus for providing ventilatory pressure support to a patient in accordance with claim 130 wherein said gain is varied more aggressively for conditions of hypoventilation than for conditions of hyperventilation.

133. (Previously Presented) Apparatus for providing ventilatory pressure support to a patient in accordance with claim 112 wherein said ventilator is flow-triggered and phase cycled.

134. (Previously Presented) Apparatus for providing ventilatory pressure support to a patient in accordance with claim 112 wherein said ventilator withdraws ventilation support more gradually when the patient is over-ventilated than when the patient is under-ventilated.